Noteworthy anatomical and physiological researches.

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Influence of gravity on sleep-movements.[1]

Fischer has attempted in these researches to discover the influence of gravitation upon the positions assumed by nyctitropic organs during the changing diurnal and nocturnal conditions. The method of experimentation adopted was simple. Two groups of cultures were arranged, in one of which plants were placed in abnormal inclinations to the plane of gravity-stimulation, while in the other, the plants were rotated upon the klinostat. By these means it was possible to show that the plants experimented upon could be grouped in two classes: (1) those which continued the nyctitropic movements regardless of the direction from which the force of gravity acted; and (2) those which failed to assume nyctitropic positions in the absence of normal gravity-stimulus. The first group of plants—to which belong Trifolium pratense, Portulaca sativa, Cassia Marylandica, Oxalis lasiandra, Acacia lophantha and others—is named by Fischer *auto-nyctitropic*. The second group, apparently smaller than the first, includes Gossypium arboreum, Phaseolus multiflorus, Lupinus albus and certain Malvaceæ, and is named *geo-nyctitropic*. These experiments, if extended, might be fruitful in explaining some difficult problems in plant positions. It would seem particularly desirable to determine, if possible, for a number of plants, the critical angle at which nyctitropic movements fail to appear. This is a line which might easily be investigated in many American laboratories.

Effects of transpiration and darkness on form.[2]

Wiesner here continues experimentation somewhat along the line indicated by Palladin and others, with reference to the connection between the form of a plant and its rate of transpiration. He has examined more particularly those plants which normally form a basal rosette of leaves, as in the case of Taraxacum, Capsella, Sempervivum, etc. He finds that

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[1] A, Fischer: Ueber den Einfluss der Schwerkraft auf die Schlafbewegungen der Blætter. Botanische Zeitung, 1890.

[2] J. Wiesner: Formænderung von Pflanzen bei Culture im absolut feuchten Raumer und im Dunkeln. Berichte der deutschen bot. Gesellsch., 1891, p. 46.

the behavior of different plants in a saturated atmosphere is by no means the same, but that there may be distinguished at least four types.

(1) The rosette of radical leaves is loosened through lengthening of internodal areas, both in darkness and saturated atmosphere. This is the case in Sempervivum tectorum.

(2) There is no change of shape in obscurity or in a saturated atmosphere. This is the case in Oxalis floribunda and Plantago media.

(3) The plant undergoes dissociation of the radical rosette in darkness but is unaffected by a saturated atmosphere. This is the case in Taraxacum officinale.

(4) The radical rosette is dissociated in the saturated atmosphere but is unaffected by obscurity. This is the case in Capsella bursa-pastoris.

Wiesner holds that in type 1 the internodal elongations are in both cases due to increased transpiration. Type 2 he finds difficult and calls into court that witness of last resort, heredity, saying that there has been produced a *phylogenetischen Entwicklung* which can not be modified by changing conditions in the life of a single culture plant. Type 3 is explained by considering that light retards growth while transpiration has little or no effect, and Type 4 indicates that transpiration may be the condition of extended growth, while light has little influence, or none at all.

It does not seem at all certain that all of these explanations are final. Type 2 could be better explained by some cause separate from those investigated, acting either actively or conservatively, to modify or inhibit the influence of the light and transpiration current. The writer called attention in the GAZETTE of May, 1890, to a peculiar epinastic position of Solanum leaves under certain conditions which, he has since come to believe were principally of modified transpiration. This same plant was afterward examined by Vöchting [4] and very good photographs given of the peculiar epinastic position. The Solanum plant also behaves in an interesting manner in a saturated atmosphere, assuming much the appearance of an etiolated plant. This was recently determined at the laboratories of the University of Minnesota. In a saturated atmosphere the leaves, however, continue to be strongly

[4] H. Vöchting: Laubblætter und Assimilationthatigkeit, Bot. Zeit., vol. 49, no. 9.

epinastic, although exceedingly small. There is also a formation, of course, of chlorophyll, and these differences suffice to distinguish between the etiolated and *hydrolated* plant. The interesting point is the permanent epinasty induced by atmospheric hydrolation; it is quite as marked in the small hydrolated leaves of Solanum tuberosum as in the large normal leaves of the same plant. Along this line further researches would supplement Wiesner's work and probably confirm and extend the investigations of Palladin. At any rate the Solanum tuberosum is recommended as a highly sensitive hydrolitic plant, and its further examination suggested to botanical workers as of much probable interest.

A monograph of plant-torsions.[1]

It is quite impossible to do justice to this voluminous and painstaking record of physiological research in a brief review. Mention will be made, therefore, of but one among the very numerous points of interest. In his researches upon the torsions in plant-organs, De Vries has had occasion to study particularly the Dipsacus sylvestris, a plant prone to exhibit these anomalous twistings of stems and leaves. He has accordingly cultivated the plant for many years in the botanical garden at Amsterdam. In six years, by careful selection, this distinguished investigator has established a variety of the teasel which is so constantly characterized by torsions in the stem and leaves that he proposes for it the name of Dipsacus sylvestris torsus. That these monstrous plants can be so rapidly produced by a systematic process of seed-selection is indeed worthy of note. For figures and descriptions the reader is referred to the article itself, which is one of the two or three most notable botanical works of the past year.

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BRIEFER ARTICLES.

Atriplex corrugata, n. sp.— Diœcious, shrubby at base, much branched, about a foot high, hoary throughout with a dense scurfy pubescence, very leafy: leaves linear-oblanceolate or -oblong, obtuse

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[1] Hugo de Vries: Monographie der Zwangsdrehungen. Pringsheim's Jahrbücher für wiss. Botanik, xxiii, pp. 13–206.